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Report on activities
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Farm Rehabilitation Act
1936/37

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ONTARIO FISHERIES RESEARCH LABORATORY

REPORT OF PROCEEDINGS

UNDER THE

PRAIRIE FARM REHABILITATION ACT

FOR THE FISCAL YEAR ENDING
MARCH 31, 1937.

DEPARTMENT OF AGRICULTURE
OTTAWA, CANADA.

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REPORT OF THE PROCEEDINGS UNDER THE PRAIRIE FARM REHABILITATION ACT.

For the fiscal year ending
March 31, 1937.

The Prairie Farm Rehabilitation Act

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in April, 1935, "to provide for the rehabilitation of drought and soil drifting areas in the Provinces of Manitoba, Saskatchewan, and Alberta". Under the terms of this Act measures are being introduced throughout the affected areas to promote those "systems of farm practice, tree culture, and water supply that will afford greater economic security", to the agricultural population. In March, 1937, the Act was amended to include "land utilization" and "land settlement" as additional objectives.

Administration of the Prairie Farm Rehabilitation Act is vested in the Federal Minister of Agriculture, who is assisted by such advisory committees as may be necessary for the most effective development of the rehabilitation program. Detailed organization and supervision is largely performed by the Dominion Experimental Farms.

The report presented here covers the second fiscal year, ending March 31st, 1937, of proceedings under the Act. During this period a considerable amount of preliminary organization work carried over from the previous years has been completed. In order to define clearly the objectives and progress of the rehabilitation program, therefore, it has seemed advisable to make many references below, to operations already reported on for the fiscal year ending March 31st, 1936.

A statement of expenditures under the Prairie Farm Rehabilitation Act for the fiscal years 1935-36 and 1936-37 is presented at the end of this report. From this statement the cost of various projects in the program may be ascertained.

The Need for Rehabilitation

The pressing need of agricultural rehabilitation in the Prairie Provinces originated in the severe droughts, accompanied by widespread wind erosion or soil drifting, which have been experienced during recent years in southwestern Manitoba, southern Saskatchewan, and southern Alberta. These conditions have resulted in serious losses to farmers through poor yields and crop failures, and to ranchers through shortage of grass, feed, and water. The economic loss caused by drought was increased in the low prices for agricultural products which prevailed through most of the drought period. The resulting shrinkage of purchasing power has impaired the efficiency of farmers. Severe hardships have been experienced, destitution has been widespread, and very large expenditures for relief have been necessary. It is the object of the Prairie Farm Rehabilitation Act, in conjunction with other governmental measures, to enable farmers and ranchers to remedy the destructive effects of drought and soil drifting, and to take precautionary measures against their recurrence.

The Rehabilitation Program

Under the rehabilitation program which has been inaugurated in accordance with the terms of this Act, efforts are being made to effect permanent improvements in dry-land agriculture by better farming practices and adjustments in land utilization. An essential feature of this work is the encouragement and assistance given to farmers to solve their own drought and soil drifting problems, by cooperative community action, with a minimum of material and financial aid from governmental sources. For this reason the rehabilitation program is largely demonstrational and fact finding, with the object of supplying guidance for the readjustment of agriculture, rather than to provide assistance in bridging temporary difficulties.

With the foregoing general objects in view, measures have been introduced throughout the drought and soil-drifting areas to ensure the most economical utilization of the limited supply of soil moisture for crop production, to prevent soil drifting, and to reclaim abandoned farm land for its most suitable use in either crop production or grazing. This phase of the program is being accomplished by the Dominion Experimental Farms through demonstrational and investigational work on District Experiment Sub-Stations and Reclamation Stations, while the interest and cooperation of farmers is being secured through Agricultural Improvement Associations. The value of drought resistant, soil-binding grasses for reclamation and soil-drifting control is being demonstrated through numerous Regrassing Projects. These Projects are especially timely in connection with the provincial land utilization policies of Saskatchewan and Alberta. Treeplanting as a drought and soil drifting control measure is being promoted on a large scale for both demonstrational and experimental purposes. Latterly, Land Utilization Studies, based on Economic Surveys, Soil Surveys and Farm Ownership Investigations have been undertaken with a view to establishing a better relationship between farming practices and soil conditions. A practical application of these studies is the assistance being granted to enable farmers on submarginal land to resettle in better areas.

A major phase of the program is the development of surface water resources for stock-watering purposes, and for the production of reserves of food and feed under irrigation.

In connection with the entire program a large amount of research is in progress, including soil research, soil survey and land utilization investigations. In addition, the demonstrational features of the program have valuable fact-finding properties.

In all phases of this rehabilitation work the ultimate object of the best utilization of land is kept in view.

The various phases of the work under the Prairie Farm Rehabilitation Act are described below in some detail, together with some account of the progress made during the period under review.

DISTRICT EXPERIMENT SUB-STATIONS

District Experiment Sub-Stations are the principal agencies through which the investigational and demonstrational facilities of the Dominion Experimental Farms are being utilized for the improvement of agricultural conditions in the drought and soil drifting areas. Comprising usually about 640 acres of land each these Sub-Stations are private farms which are operated under government supervision for the demonstration and further trial of the best known methods of crop production under severe drought and soil drifting conditions. Since the inauguration of the rehabilitation program 46 Sub-Stations have been established, 39 during the fiscal year of 1935-36, and 7 during the following fiscal year.

The location by general districts of the various District Experiment Sub-Stations is shown on the following list. Those established during the fiscal year ending March 31st, 1937, are indicated by the figures (1936-37), while those not so indicated were established in the fiscal year (1935-36).

Check-List of District Experiment Sub-Stations Operating under the Prairie Farm Rehabilitation Act as of March 31st, 1937.

Southwestern Manitoba

Goodlands
Lyleton
Pipestone

Southeastern Saskatchewan

Alameda
Avonlea
Craik (1936-37)
Davidson(1936-37)
Kisby (1936-37)
Radville
Strasbourg
Weyburn

Southwestern Saskatchewan

Canuck
Carmichael
Fox Valley
Gravelbourg
Herbert
Kincaid
Limerick
Lisieux
Parkbeg
Piapot
Riverhurst
Shaunavon
Tompkins
Tugaske
Valjean
Willowbunch

Central Saskatchewan

Dunblane
Guernsey
Juniata
Kindersley
Loverna
Rosetown

Southern Alberta

Bindloss
Castor
Cessford
Claresholm (1936-37)
Consort
Drumheller(1936-37)
Foremost
Lomond
Metiskow (1936-37)
Rockyford (1936-37)
Whitla
Youngstown
Pincher Creek

In view of the fact that conditions on the District Experiment Sub-Stations are typical of the drought and soil drifting area as a whole, and the remedial and preventative measures being adopted on these stations are of general application, the following description of Sub-Station operations is representative of the improvements in crop production being introduced under the rehabilitation program.

Cropping Practices

The principal limiting factor governing crop production in drought area is the lack of sufficient soil moisture, which is sometimes totally inadequate for economical crop production. This condition profoundly affects cropping practices, limiting the choice of crops to the relatively drought-resistant grains, principally wheat, and requiring special measures to serve the optimum utilization of the available soil moisture. For this reason, a two-year rotation of summerfallow and grain is uniformly practised on all District Experiment Sub-Stations, moisture being stored in the soil during the fallow years to supplement rainfall deficiencies during the alternate crop years. On some Sub-Stations a three-year rotation of summerfallow, grain, grain is also followed for comparison with the two-year rotation. An important function of the summerfallow is to destroy weeds which would otherwise utilize the scanty soil moisture supplies to the detriment of the grain crops.

Soil Drifting Control

During recent dry years soil drifting has resulted in severe and permanent damage to extensive areas of soil throughout the southern parts of the Prairie Provinces. This tendency to drifting arising from the action of high winds on soil which is relatively poor in plant fibre, is increased by the necessary practice of summerfallowing, which exposes the soil without vegetative protection, and in a more or less pulverized condition. Under conditions of severe drifting, the surface soil is blown into drifts, thereby interfering gravely with the tillage operations, and leaving areas of the subsoil exposed, with a serious reduction in fertility. As soil drifting has assumed unprecedented proportions during recent years, several measures of control including strip farming, cultural practices and cover crops are being tested and demonstrated on the District Experiment Sub-Stations, including strip farming, cultural methods and cover crops.

Strip farming is a method of reducing drifting on fallow land to a minimum by alternating long, narrow strips of summerfallow with similar strips of growing crops. These strips, ranging in width from 4 to 16 rods, are run at right angles to the prevailing strong winds. Drifting which may occur on the fallow strips is checked by the alternate crop on stubble strips, thereby limiting the damage to a confined area.

Strip farming has proved very effective in checking soil drifting in some localities, particularly in southern Alberta. For this reason, part of the grain on each Sub-Station is grown in strips, with the object of introducing this practice in districts where it has not been previously tried. In many districts throughout Saskatchewan and Alberta strip farming was first practised on the local Sub-Stations. At Avonlea strip farming was adopted on the local Illustration Station in 1932, and was already well established when this station was enlarged into a Sub-Station in 1935.

Cultural practices in the preparation of land for seed, especially on fallow, have considerable influence on the readiness with which soil drifts. Experience has shown that drifting on cultivated land is less likely to occur where a good "trash" cover of stubble and dead weeds is retained on the surface, than where this material is completely buried. Good trash cover is maintained by shallow cultivation including the "ploughless" fallow in which the seed bed is prepared without ploughing.

Cultivation which leaves the surface in a rough, cloddy condition is a useful control measure, which has given very promising results on the Sub-Stations. Under conditions of emergency, drifting may be checked by ploughing furrows at about two-rod intervals across the affected area at right angles to the direction of drifting, or by using the duckfoot cultivator or lister in a similar manner.

On each District Experiment Sub-Station various cultural practices are being compared with a view to determining those which are most suitable to control drifting under local conditions.

Cover crops of fall sown spring grain are being used on part of the summerfallow land on each Sub-Station to prevent fall and spring drifting. This practice may be followed in conjunction with strip farming or on large fields. As cover crops are usually sown about the first of August they do not make sufficient growth before freeze-up to greatly reduce the moisture conserved during the previous period of bare fallow. Where rainfall is sufficient to produce fair growth, cover crops may prevent soil drifting, provide some grazing and retain a snow cover against winter winds.

In some cases drifting on fallow land may be controlled by growing corn in single rows at about two-rod intervals or by drill-width strips of hemp at about four-rod intervals, the seeding being done at right angles to the prevailing strong winds. A combination of strip farming, together with the use of surface cultivation to maintain a trash cover, has proved quite effective in the control of soil drifting.

Farmstead Improvement

On all District Experiment Sub-Stations certain measures are undertaken to improve living conditions around the farm home. These measures include the establishment of farm home shelterbelts of trees and hedges, for the protection of buildings and home surroundings against high winds and drifting soil. Provision is also made for farm gardens; poultry flocks are established or improved, and efforts are made to maintain some livestock. One result of these measures is to provide a supply of foodstuffs for domestic use, which tends to offset the hardships caused in periods of low field crop production.

Grass and Clovers for Hay and Pasture

On Sub-Stations where conditions are favorable to the production of hay or pasture, efforts are made to establish stands of desirable grasses or clovers. Preference in this work is given to relatively drought resistant species, notably crested wheat grass, brome grass, and sweet clover. In some areas alfalfa is grown on low land. One result of this work will be to determine the most suitable grasses or clovers for various districts, as well as the economic feasibility of cultivated hay or pasture seedings.

Work on the District Experiment Sub-Stations during 1936

In 1936 the majority of the Sub-Stations passed through their second season of field work since the inauguration of the rehabilitation program. During this period various drought and soil drifting control measures were brought into full operation. Throughout most of the area served by the Districts Experiment Sub-Station the growing season of 1936 was characterized by very dry, hot weather during June and July. As a result, the yields secured on Sub-Stations were generally low, complete failures being experienced in a number of cases. Exceptions occurred

at Tugaske, Sask. and Guernsey, Sask. where relatively high summer rainfall resulted in yields of wheat on fallow of slightly over 20 bushels per acre.

Soil Drifting Control in 1936. The outstanding feature of Sub-Station work during the year was the high degree of success attending soil drifting control measures. No drifting of any consequences occurred on any of the Sub-Stations, even in districts where drifting was severe. This desirable condition was brought about by the use of various control measures, particularly strip farming combined with cultural practices on fallow land which produced a rough cloddy surface with as much trash cover as possible.

Increase in Acreage under Strip Farming. Largely as a result of the demonstrational work of the Sub-Stations, strip farming is being adopted on an increasing number of farms in the drought area. In parts of southwestern Saskatchewan it has been estimated that 25 per cent of the cultivated land is now under strip farming, and the acreage under strip farming in other drifting areas is increasing.

Cover Crops. Cover crops sown on Sub-Stations in the fall of 1935 failed, for the most part, to make sufficient growth to provide any protection against drifting. This condition was due partly to drought and partly to grasshopper ravages. On some of the Sub-Stations in Central Saskatchewan, some success with cover crops was secured. At Rosetown, where a good cover of wheat was secured in the fall of 1935, the average yield of wheat in 1936 following the cover crop was 15.5 bushels per acre as compared with 16.3 bushels where no cover crops were sown. This result indicates that a cover crop does not necessarily cause a large reduction in the yield of the succeeding crop. In view of the very unsatisfactory results secured with cover crops during 1936, however, no definite conclusions as to their value can be drawn.

Sub-Station Gardens during 1936.

On most of the Sub-Stations, a sufficient supply of vegetables was grown during 1936 for home consumption. In many cases some fruit was also grown. For the most part these Sub-Station gardens are protected from high winds by shelterbelts, and a two-year rotation of summerfallow garden crops is followed. To these measures is due the encouraging results which have been secured, keeping in mind the very unfavourable weather conditions which prevailed.

Tree-Planting on Sub-Stations during 1936. During 1936 a total of 62.040 tree seedlings were supplied to a number of Sub-Stations for the establishment or renovation of shelterbelts. Considerable work was done in improving existing plantations, dead trees being replaced and provision made for improved soil moisture conditions by cultivating narrow fallow strips adjacent to the trees.

Livestock and Poultry Production on the Sub-Stations. During the year efforts were made to enable Sub-Station operators to improve their livestock and poultry enterprises. Particular attention was given to poultry, chicks being procured from the Dominion Experimental Farms to the Sub-Station operators with a view to the propagation of good breeding stock.

RECLAMATION

Reclamation work under the rehabilitation program has for its object either the return to crop production of land severely injured by soil drifting, or the establishment of grass cover on areas of abandoned sub-marginal land where soil drifting or weed infestation endangers adjacent territory. A number of reclamation projects, varying in magnitude from extensive expermental layouts to small regrassing demonstrations, have been established.

The following descriptive outline will indicate the nature and progress of this work.

Melita Reclamation Station, Man. Extensive experiments on the reclamation of land on which crop production had been abandoned due to drought and soil drifting have been established on two sections of light soil near Melita in southwestern Manitoba. This Station is under the supervision of the staff of the Dominion Experimental Farm at Brandon, Man. During the past season considerable progress has been made in remedying the effects of soil drifting on this land and in checking its recurrence by the various methods under investigation. These methods have included strip farming, various cultural practices, spreading straw, weeds, and refuse hay on focal points of drifting.

Work on establishing grasses and clovers by various methods on land particularly susceptible to drifting has been started. This regrassing program covers comparisons of different species, of different methods of seeding down, and of various rotations which include hay or pasture crops. Other investigations during the past season on this Station include fertilizer tests on eroded land, and the establishment of field crop shelterbelts. While many of the projects on this Station are still in the initial stage, and many difficulties have been encountered, there has been already a sufficient number of encouraging results to indicate the probability of ultimate success.

Mortlach Reclamation Station, Saskatchewan. The objects and procedure in the reclamation experiments at Mortlach occupying 1380 acres of land, are similar to those at Melita. At Mortlach where much of the land is seriously eroded, considerable difficulty has been experienced in establishing sufficient cover to prevent further soil drifting. Fall rye has been sown over large acreages with the object of holding the soil until grasses could be sown. On some areas reseeding the rye has been necessary, former seedings having been destroyed by drought and soil drifting. In spite of these difficulties, however, some success has been experienced in seeding down grasses on abandoned land, especially with late fall seeding, and in checking soil drifting by strip farming. The Mortlach project, together with the Cadillac project described below, is under the supervision of the Dominion Experimental Station at Swift Current, Sask.

Cadillac Reclamation Station, Saskatchewan. This Station comprising 1280 acres, was established in 1936 for the reclamation of an area near Cadillac, Sask. where soil drifting has been extremely serious. Very dry conditions prevented work being started during the summer, but autumn rains have enabled some necessary fall seeding of grain so as to prevent drifting and to enable spring seeding being undertaken with some hope of success.

Regrassing Reclamation in East Central Alberta. In the district of Alberta lying between Medicine Hat in the south and Sullivan and Sounding Lakes in the north, a considerable percentage of the land has been abandoned by farmers on account of insufficient precipitation. As a result of this abandonment the land is either covered with weeds or subject to soil drifting. In order to remedy this condition by re-establishing grass for grazing purposes, regrassing reclamation projects were started in 1935 at the following points: Naco, Sounding Creek Area; Stanmore, North Berry Creek Area; Cessford, South Berry Creek Area; Hutton; and Bowell Tilley East Area. During 1936 additional projects were started in the Sullivan Lake Area, and at Youngstown. The acreage involved in

these projects varies from 160 to 600 acres. In each of these projects different methods of seeding down grass, principally crested wheat grass, are under investigation. These methods include broadcasting and drilling seed, with and without cultural preparation, at different times in the year. From the results so far secured it would seem that late fall seeding of grasses just before freeze-up is preferable to spring or summer seeding. Regrassing reclamation work in southern Alberta is supervised from the Dominion Experimental Station at Lethbridge, Alberta.

Regrassing Demonstration in the Ribstone Area of Alberta. During the past summer new regrassing demonstrationswere started on sandy land at eight points in the Ribstone area of Alberta, between Sounding Lake and Wainwright. Each of these demonstrations, consisting of about 5 acres seeded to crested wheat grass in comparison with a like area seeded to brome grass, should indicate the relative suitability of these grasses for soil drifting control in this area. The results of these and other similar projects described below will not become fully apparent until the spring or later in 1937.

Regrassing Demonstrations in Central Saskatchewan. In 1935 small regrassing demonstrations with crested wheat grass were started at ten points on sandy areas near Kerrobert, Sask. During the past summer these projects have suffered severely from drought, a considerable amount of reseeding being necessary.

New regrassing demonstrations with crested wheat grass were established at eleven points in Central Saskatchewan during the past summer. These projects are distributed throughout the area between Elbow, Sask. and the Saskatchewan - Alberta boundary.

Regrassing demonstrations in the Ribstone area of Alberta and in Central Saskatchewan are supervised from the Dominion Experimental Station at Scott, Sask.

Regrassing Reclamation in Southeastern Saskatchewan. During the past summer reclamation work was started on an area of badly drifted land near Craik, Sask., with the object of establishing a soil-binding grass cover. As a preliminary measure grain was sown on over 900 acres of land to provide some cover which will check drifting until a stand of grass can be secured. A similar but smaller project was started near Kisby, Sask. Both of the projects have been undertaken in response to requests from local authorities, and are being supervised from the Dominion Experimental Farm at Indian Head, Sask.

Regrassing Demonstrations in Southwestern Saskatchewan. Small demonstrations of regrassing, varying in area from 10 to 25 acres were started during 1936 at three points near the Dominion Experimental Station at Swift Current in southwestern Saskatchewan, and at four points in the grazing area near the Dominion Range Experiment Station at Manyberries in southern Alberta.

AGRICULTURAL IMPROVEMENT ASSOCIATIONS

With the object of securing cooperative community action on the solution of drought and soil drifting problems, farmers in various districts have been formed into Agricultural Improvement Associations under the Prairie Farm Rehabilitation Act. It is partly through these Associations that the rehabilitation program is brought into personal contact with the farmers in the drought area. In general, the area represented by a single Association is equivalent to one rural municipality, although variations in this respect have been advisable in some localities. Membership is largely rural, but urban occupations are sometimes beneficially represented.

Inasmuch as the effective functioning of the Agricultural Improvement Associations contributes appreciably to the successful development of the rehabilitation program, various forms of assistance are provided under the Act to ensure their continued activity. In addition to providing advisory assistance for the organization and subsequent operation of these Associations, the Dominion Government supplies suitable grass and clover seeds for propagation purposes and of nursery stock for tree planting, for distribution to members. Personal advisory service is also provided regarding the practical application of rehabilitation measures to individual or community farming problems. Financial assistance is granted to each active association for administration expenses, amounting to a minimum of $50.00 per annum, plus 50 cents per member over 100 to a maximum of $100.00 per annum.

Since the inauguration of the rehabilitation program, 41 Associations have been formed 24 during the fiscal year 1935-36, and 14 during 1936-37. In addition, three Strip Farming Associations formed prior to April, 1935, were brought under the provisions of the Act, making a total on March 31, 1937, of 42 Associations with 5549 members. The names and headquarters of these Associations are shown in the following statement, those formed during the past fiscal year being indicated by the figures (1936-37).

Agricultural Improvement Associations under the Prairie Farm Rehabilitation Act, as of March 31, 1937

Name of Association		Headquarters
Manitoba		
Boissevain Agricultural Improvement Association	(1936-37)	Boissevain
Goodlands " " "		Goodlands
Killarney " " "	(1936-37)	Killarney
Lyleton " " "		Lyleton
North Brenda " " "		Medora
Pierson " " "		Pierson
Sifton-Pipestone-Albert Agricultural Improvement Association		Reston
Waskada Agricultural Improvement Association	(1936-37)	Waskada
Saskatchewan		
Aneroid Strip Farming Association		Aneroid
Beechy Agricultural Improvement Association		Beechy
Cavell " " "	(1936-37)	Cavell
Ceylon " " "		Ceylon
Chaplin " " "		Chaplin
Craik " " "	(1936-37)	Craik
Estevan " " "		Estevan
Eye Hill " " "	(1936-37)	Primate
Gull Lake Strip Farming Association		Gull Lake
Hazenmore Agricultural Improvement Association		Hazenmore
Herbert " " "		Herbert
Kenaston " " "	(1936-37)	Kenaston
Kincaid " " "		Kincaid
Lafleche " " "		Lafleche
Limerick Strip Farming Association		Limerick
Lucky Lake Agricultural Improvement Association		Lucky Lake
Macrorie " " "		Macrorie
Maple Creek " " "		Maple Creek
Meyronne " " "		Meyronne
Minton " " "		Minton

Name of Association		Headquarters
Mortlach Agricultural Improvement Association		Mortlach
Parkdale " " "	(1936-37)	Hoosier
Shaunavon Strip Farming Association		Shaunavon
Side Wood Agricultural Improvement Association		Side Wood
Tomkins " " "	(1936-37)	Tomkins
Tugaske " " "		Tugaske
Valor " " "		Valor
Vanguard " " "	(1936-37)	Vanguard
Verto " " "	(1936-37)	Verto
Weyburn " " "		Weyburn
Wilkie " " "	(1936-37)	Wilkie
Alberta		
Argyle-Clearlake Agricultural Improvement Association		Claresholm
Grasswold " " "	(1936-37)	Rockyford
Neutral Hills " " "	(1936-37)	Consort

The activities of the Agricultural Improvement Associations during the past fiscal year have been somewhat diversified including meetings at opportune times for the discussion of common problems, field days for demonstration purposes at Experimental Stations and District Experiment Sub-Stations, and the formation of various community groups for the promotion of livestock improvement policies. By means of questionnaires submitted to members of Associations, officials of the Dominion Experimental Farms have been able to ascertain the nature of the problems facing farmers in different districts as well as the measures being adopted for their solution. On the basis of this information it has been possible to increase the effectiveness of various rehabilitation measures. In some districts the aims of local Associations have been directed to the solution of peculiar local

problems. In the Municipality of Grasswold, Alberta, for instance, the local Association is principally interested in seeding down road allowances with brome grass as a measure of saw-fly control. In other districts better utilization of sub-marginal land community grazing is being fostered. The majority of the Associations, of course have for their main objects the introduction of drought and soil drifting control measures. In this work a considerable degree of cooperation has been effected, as much as 80 per cent of the land in some districts having been brought under strip farming during 1936.

TREE PLANTING

Tree planting, with the object of improving living conditions on prairie farms, and of providing protection for gardens and crops against the erosive and drying effects of high winds, is being undertaken as part of the rehabilitation program.

Afforestation on the naturally treeless prairies is beset with many difficulties arising principally from adverse climatic conditions, but also from the lack of suitable planting stock. In order to assist farmers in overcoming these difficulties in establishing desirable shelterbelts of trees and hedges, expert forestry advice and supplies of tree seedlings have been supplied free for a number of years from the Dominion Forest Nursery Stations of the Dominion Experimental Farms. These forest nursery stations are located at Indian Head, Sask., and Sutherland, Sask. This service has been provided at Indian Head since 1901 and at Sutherland since 1914. During the 36-year period from 1901 to 1936, a total of 145,163,300 tree seedlings and cuttings have been distributed from the same stations to well over 55,000 farmers. Under the rehabilitation program this service is being extended to include the following activities:

1. District Experiment Sub-Stations - Special Assistance being granted on these Sub-Stations for tree planting for demonstration purposes.

2. Agricultural Improvement Associations - Members of these Associations may receive a limited number of trees delivered free to the nearest railway station, plus financial assistance of $3.50 per thousand for planting. In 1936 some 224 plantations were set out through these Associations, for which 229,380 seedlings were provided.

3. Field Crop Shelterbelt Associations - The work of these Associations represents a very interesting phase of the rehabilitation program. Field Crop Shelterbelt Associations comprise groups of farmers located on neighbouring farms who have undertaken with

government assistance, to plant shelterbelts on their crop land, the belts being spaced to enclose from 20 to 80 acres. The object of this work is to determine whether a fairly extensive system of shelterbelts will exert a beneficial influence on crop production by modifying the intensity of adverse meteorological factors such as high winds, rapid evaporation and loss of snow cover. This work which is of a purely experimental nature, will require many years for the demonstration of results and is confined to a few selected areas. Members of these Associations receive the following assistance, subject to supervision from the Forest Nursery Stations: Trees delivered free to the nearest railway station, $3.50 per thousand for planting, and $20.00 per mile of shelterbelt for subsequent care during the currency of the Prairie Farm Rehabilitation Act.

Field Crop Shelterbelt Associations have been formed at the following points: Lyleton, Man., Conquest, Sask., Aneroid, Sask., and Porter Lake (Ribstone), Alta. Planting was started at Conquest in 1934, and at the other points in 1936. The Conquest Association comprising 59 members represents an area of 63 square miles. Within this area some 90 miles of shelterbelt have been planted including 70 miles in 1936, while preparations are complete for planting 143 miles in 1937. Plantings during 1936 at Lyleton, Aneroid, and Porter Lake amounted to 1, 5.7 and 4 miles respectively, while more extensive work is contemplated for 1937. In spite of adverse weather conditions in 1936 a considerable degree of success has attended the foregoing work.

In addition to the work described above, some assistance is being given to a similar municipal project at Kindersley, Sask.

The progress made during 1935 and 1936 in tree-planting under the rehabilitation program is shown in the following table. As a matter of record the number of trees supplied under the ordinary tree distribution is included in this table.

Tree Planting Work Under the
Prairie Farm Rehabilitation Act 1935 and 1936

	Trees Supplied	
	1935	1936
District Experiment Sub-Stations	15,690	62,040
Agricultural Improvement Associations	nil	229,380
Field Crop Shelterbelt Associations	-	-
Lyleton, Man.	nil	4,000
Conquest, Sask.	82,575	388,775
Aneroid, Sask.	nil	30,150
Porter Lake (Ribstone) Alta.	nil	24,805
Kindersley (Sask.) Municipal Project	37,500	65,025
Reclamation Projects	-	20,525
Total for rehabilitation	135,765	824,675
Ordinary free distribution (other than P.F.R.A.)	6,304,430	6,484,844
Total distribution in Prairie Provinces	6,440,195	7,309,519

During 1937 it is estimated that over 2,000,000 trees will be planted under the rehabilitation program.

In addition to the foregoing tree-planting work through federal agencies, an area of 35 acres was planted with white spruce at the Adam's Lake Dam in Saskatchewan by the Provincial Department of Natural Resources. The cost of this work was borne by the Federal Government.

GRASS SEED DEVELOPMENTS

The establishment of grass on submarginal areas has been already noted as an important rehabilitation measure Seed supplies for this work are secured by the Forage Crops Division of the Dominion Experimental Farms, Ottawa, from various sources, but principally through the Dominion Forage Crops Laboratory at Saskatoon, Sask., in cooperation with the Dominion Seed Branch. The amount of seed purchased during the past fiscal year for rehabilitation purposes, exclusive of seed grain distributed by the Seed Branch, is shown in detail in the following table.

Quantity of Seed Purchased for Rehabilitation Purposes

During the fiscal year ending March 31st, 1937.

Variety of Seed	Pounds
Grasses	
Crested wheat grass	73,136
Creeping red fescue	1,000
Sudan grass	300
Brome grass	19,361
Western rye grass	2,000
Legumes	
Alfalfa	19,330
White sweet clover	20,250
Yellow sweet clover	6,800
Total grasses and legumes	142,177
Cereals	Bushels
Marquis wheat	480
Banner oats	660
Gopher oats	10
Regal barley	256
Fall rye	100
Falconer corn	60
Northwestern Dent corn	64
Minnesota corn	60
Total cereals	1690

A considerable proportion of the foregoing seed supplies was purchased for use during the fiscal year 1937-38. Some of the grass seed, however, was used in fall seeding during 1936.

In addition to securing seed supplies as described above, the Dominion Forage Crops Laboratory at Saskatoon has undertaken a number of investigations relative to the establishment of grass cover under drought or soil drifting conditions.

During the year 1936, experiments were conducted at several points in the vicinity of Saskatoon with the object of obtaining information relative to the effect of different methods of seeding down slender wheat grass (Agropyron Pauciflorum), brome grass (Bromus inermis), crested wheat grass (Agropyron cristatum), sweet clover (Melilotus alba) and alfalfa (Medicago media). The seedings were, for the most part, made on abandoned land which was of the fine sandy loam type, although clay loams were included in some cases.

In all cases the land carried a trash cover- mostly in the form of old Russian thistle plants or other wild growth. Only in one instance was the seed sown into bare, drifting land.

In addition, seedings of the above crops were made at different dates with the object of determining the effect of time of seeding upon the stand obtained. The dates of seeding for most of this material was as follows:

1. Early spring (late April).
2. Late spring (about June 15th).
3. Late summer (early September).
4. Fall of the year (just before freeze-up).

The methods of seeding included:

1. Broadcasting the seed in land carrying a good weed cover, without any tillage either before or after seeding.

2. Broadcasting followed by a light discing.

3. Drilling into land covered with a weed growth without any tillage before or after seeding.

4. Drilling after a light discing.

5. One set of plots was also sown with fertilizer (ammonium phosphate) at the rate of 20 lb. per acre in comparison with non-fertilized plots on sandy land.

Some work has been done in an endeavour to determine the reasons for so many poor stands of sweet clover. Preliminary

tests in the laboratory and greenhouse suggested that certain organisms probably attacked the seeds under certain conditions and caused them to decay. In order to get additional information a quantity of seed was treated with organic mercury dust (new Improved Ceresan) and this will be sown at several points in 1937 in comparison with untreated seed.

Other work has consisted of increasing seed of promising new production which may be of value in the reclamation work.

In addition to the above, a date-of-seeding test, in which crested wheat grass was sown at intervals of two weeks throughout the growing season, beginning as soon as the land can be worked in the spring and continuing until freeze-up in the fall, was carried on as in previous years. This test has given a great deal of information regarding the effect of time of seeding this species on the stand obtained.

DISTRIBUTION OF PURE SEED GRAIN

As a result of repeated crop failures seed grain of good quality has become somewhat scarce in the drought areas. To offset this undesirable condition, arrangements have been made with the Dominion Seed Branch to facilitate the distribution of good seed grain throughout the drought areas. During the past fiscal year a total of 230,841 bushels of seed grain of good quality have been distributed throughout the drought area. This quantity of grain was made up of 107,528 bushels of wheat, 115,241 bushels of oats, 7,888 bushels of barley, and 184 bushels of flax.

Freight costs on the distribution of this grain were paid from Prairie Farm Rehabilitation Funds.

SOIL SURVEY

With the object of making an inventory of soil resources in the Prairie Provinces, the nature, location and extent of the various types of soil in certain areas is being determined through soil surveys. Soil survey work has been in progress in each of the provinces for several years, in many cases as a cooperative project between the Provincial Agricultural College and the Dominion Experimental Farms. Under the rehabilitation program this work is being continued and accelerated with a view to securing complete information for land utilization and land settlement purposes.

Soil Survey in Manitoba during 1936

During 1936 the Manitoba soil survey was extended to the area lying between Townships 1 to 7 inclusive, Ranges 4 to 18 inclusive, West of the First Meridian. In 1935 the soil survey covered with adjacent area to the west, lying between Townships 1 to 7 inclusive, and between Range 18 and the Saskatchewan boundary. The combined area of these surveys covers the major drought and soil drifting region of Manitoba. In the Red River Valley an area including Townships 1 to 9 and covering three Ranges on both sides of the First Meridian, was surveyed some years ago. Practically all of the soils of Manitoba north of the foregoing area remain to be surveyed.

Soil Survey in Saskatchewan in 1936

During 1934 the reconnaissance soil survey of the province as far north as Prince Albert was completed, as a result of surveys covering several years. The report and maps for this survey were published in May, 1936, by the Provincial Agricultural College at Saskatoon, with assistance from the Dominion Experimental Farms. This reconnaissance soil survey of Saskatchewan was extended during 1936 to the area lying north of Prince Albert, between White Fox and Henribourg.

Detailed soil surveys were made during 1936 of severely drifted areas at Mortlach and Cadillac in connection with reclamation work as well as on the new irrigation projects at Val Marie and Eastend.

Soil Survey in Alberta in 1936

During 1936 a soil survey was made of the area lying between Township 17 to 24 inclusive and Ranges 1 to 15 inclusive, west of the Fourth Meridian. This area includes some of the irrigated land in the vicinity of Brooks, as well as a considerable area of dry land to the East of Brooks. In addition, about 24 townships were covered in the Sullivan Lake district.

Several areas in the southern part of Alberta have been covered by soil surveys in the past, but more than half of the area remains to be covered.

SOIL RESEARCH

Soil research under the rehabilitation program has for its object the determination of the fundamental principles underlying soil moisture conservation, soil drifting control, and the maintenance and improvement of soil fertility. This work, which is linked up with the field investigations of the Dominion Experimental Farms and with various rehabilitation projects, is conducted at the Dominion Soil Research Laboratory, Swift Current, Saskatchewan. In addition some soil research work which is described below, is being conducted in cooperation with the soils departments of each of the three provincial universities in the Prairie Provinces.

Work of Soil Research Laboratory at Swift Current, Sask., during 1936-37

During the period under review the new Soil Research Laboratory Building at Swift Current, which was constructed in 1935, has been equipped for the physical and chemical investigation of soils. The completion of this laboratory will greatly facilitate and extend existing research work in progress on the Dominion Experimental Farms and Stations.

Since the inauguration of the rehabilitation program a considerable amount of research has been done to determine to what extent the speed of wind over cultivated land may be checked by shelterbelts, hedges, and other obstructions. In these studies, batteries of anemometers have been placed at different distances to leeward of various types of shelterbelts, or at different heights above growing crops and bare land to determine what reduction in wind velocity is effected by these obstacles. The following results are typical.

A double row of spruce trees, 25 feet in height caused a reduction in wind velocity of 50 per cent to a distance of 200 feet to leeward, and some reduction to a distance of 400 feet. Wider, denser belts caused somewhat greater reductions, while thinner belts were less effective. A corresponding slight reduction

was observed in the rate of evaporation.

The effect of shelterbelts on crop yield varies from season to season, depending on soil moisture conditions. In 1936, one four-row belt of caragana and maple increased the yield of wheat to a distance of 150 feet into the field. This condition resulted from snow accumulation on the lee side of the belt.

Studies conducted in connection with strip farming showed slight but definite reductions in wind velocity over fallow land caused by strips of growing crops and binder stubble. This effect accounts in part for the effectiveness of strip-farming in checking soil drifting.

The foregoing investigations, supervised from Swift Current, were conducted in various places, including the Conquest Field Crop Shelterbelt Association area and the Forest Nursery Station at Indian Head. Continuance and extension of this work is planned for the future.

Cooperative Soil Research Projects

During 1936 the following lines of soil research were conducted by the Universities of the Prairie Provinces in co-operation with the Dominion Experimental Farms.

Manitoba. "The Quality and Composition of Crops as Influenced by Soil Type and Fertilizer Treatment".

Saskatchewan. "The Nature and Treatment of Alkali Soils and Blow-out Soils".

Alberta. The Nitrogen, Phosphoric Acid, and Potash Content of Soils. Losses and Gains under different conditions.

The results of the foregoing investigations, when complete, will be of considerable value in explaining some of the principles of crop production and soil management.

LAND UTILIZATION

Economic Survey

Studies in land utilization begun in 1935 by the Economics Branch of the Federal Department of Agriculture, have been continued during the past year but more emphasis has been placed upon land classification and data essential to a programme of rehabilitation than was the case in 1935. Less emphasis has been given to what might be called details of Farm Management.

In Saskatchewan during 1936, data were obtained in seven rural municipalities:- Laurier, The Gap, Bengough, Brokenshell Norton, Key West and Excel.

All occupied farms were visited. Soil differences from the general mapping of the area, topographical features, degree of stoninees, and other factors were recorded and mapped and a rating given to the farm buildings. The farmers cooperated in giving information for each quarter as to the location of the land which they operated, tenure, ownership, acres cropped, in fallow, idle and pasture, the number of years land was cultivated, how and when acquired, number of years since he was able to pay the taxes (owner), number of years receiving direct and agricultural relief, water facilities and kinds and numbers of live stock. Estimates were obtained from about thirty-five percent of the farmers on the wheat yields obtained on their farms for the past fourteen years, and a large number gave estimates as to the carrying capacity of the pasture land. Information was also obtained on the vacant and abandoned parcels within the seven municipalities, as to ownership, year first farmed, year last farmed, amount at one time cultivated and most of these were inspected by the enumerators, and physical characteristics recorded. From the municipal offices, data as to ownership was completed and that obtained previously checked, assessment values

for each parcel, the number of years a parcel had appeared in tax sale proceedings for the eight years preceding 1930 and description of parcels not redeemed.

From the data assembled maps have been prepared showing boundaries of occupied farms, vacant and abandoned parcels, parcels which have never been occupied, occupier or owner, soil classes, classes according to topography, according to degree of stoniness, boundaries of varying proportions of land cultivated in 1936 and enumerator's rating of farm buildings. A series of these maps has been prepared for each of the seven municipalities. Each map of a series is prepared on the same scale so that one map might be superimposed over another for comparing associated criteria and arriving at decisions as to where land class divisions should be made. The process is an attempt to determine inductively the boundaries of land classes according to their best utilization.

In Alberta what is known as the Sounding Creek area was covered in a manner similar to that followed in Saskatchewan but additional data on farm receipts and liabilities were obtained, in order that information which might be the basis of a programme of rehabilitation could be made available. This work involved an analysis of 11,000 quarter-sections of land and from the data obtained, location, occupied buildings and abandoned buildings were mapped. The present use of land, tax delinquency, soil topography and land classes were also mapped.

Land Settlement

During the fiscal year 1936-37 a policy of assisting provincial authorities in the movement of settlers from submarginal to better class lands was inaugurated as part of the rehabilitation program. Under this policy the Dominion Department of Agriculture pays the freight charges on settler's effects and livestock on removals arranged and approved by the Provincial Governments, a special two-thirds rate for this purpose being allowed by the railway companies. The ultimate object of this phase of the program is to effect improvements in land utilization, by withdrawing from cultivation land which is unsuited to that purpose. At the same time, the former occupants of such land will be enabled to improve their economic conditions.

A start in bringing the above-mentioned policy into operation was made in Saskatchewan during the fall and winter of 1936-37, a total of 63 farmers being assisted to move to new locations. In general, these farmers have moved into the eastern half of the province, between Weyburn and Prince Albert from points lying south of Swift Current, Moose Jaw, and Weyburn, as well as from points in the northwestern district between Townships 27 and 51, Ranges 11 and 25 West of the Third Meridian.

The extension of this service to a larger number of farmers, and to the Provinces of Manitoba and Alberta, is contemplated for the near future.

Farm Ownership Investigations

For the purpose of obtaining information regarding financial and other conditions in marginal and sub-marginal areas, with a vew of effecting necessary adjustments in land utilization, Farm Ownership Investigations were started early in January, 1937, under the Prairie Farm Rehabilitation Program.

In conducting these investigations, contacts have been established with the Land Utilization Board of Saskatchewan and all governing bodies within the areas under study, including the municipalities. From these sources data relative to taxes and relief costs have been secured and analysed preparatory to commencing actual farm surveys. Information regarding land ownerships and debt relationships have been secured from the Land Titles Offices. Data regarding crop yields, farm practices, soil drifting, as well as the condition of school and telephone services, and other community activities, have been secured in farm-to-farm surveys. In this manner a fairly complete picture of agricultural conditions in each district has been secured, providing a dependable basis for the development of land utilization policies.

This work so far has been confined to the following four typical areas in Saskatchewan:

1. Rural Municipality of Estevan No. 5, containing approximately 207,360 acres.
2. Rural Municipality of Mariposa No. 350, containing approximately 163,840 acres.
3. Matador Ranch and surrounding territory, containing approximately 530,000 acres.
4. Frenchman River Drainage Basin, containing approximately 1,106,000 acres.

As the work progresses other areas containing submarginal land will be covered.

FEED RELIEF ADMINISTRATION

During 1936, the Dominion Government agreed to provide funds to the amount of $4,700,000 for the purchase and distribution during the winter of 1936-37, of feed and fodder for live stock in certain drought stricken areas of the Prairie Provinces. Agreements with the Provinces were entered into in August, 1936, and were to run to the end of March, 1937. The purchase and distribution of feed and fodder under this arrangement was supervised by members of the Prairie Farm Rehabilitation Staff.

Actual records of the quantities of material distributed, however, were kept by the Federal Department of Finance.

WATER DEVELOPMENT

The development of water for agricultural use is a major activity under the rehabilitation program, and one which has already resulted in substantial benefits to farmers and rancher in the drought area. The object of this work is to provide for the storage, by means of dugouts or dams, of spring run-off water for domestic, stockwatering, and irrigation purposes in districts where the normal summer supply is inadequate for the optimum utilization of crop or grazing land.

This work is conducted under the supervision of a Water Development Committee for each Province, consisting of three Dominion Officials who sit on all three committees, and one Provincial Official for each individual committee. Prior to 1936 one Water Development Committee served all three Provinces.

Under the terms of the Prairie Farm Rehabilitation Act, engineering services and financial assistance are made available to farmers and ranchers in the drought area for the excavation of dugouts and the construction of small stockwatering dams and irrigation schemes. During the fiscal years 1935-36 and 1936-37, financial assistance under this Act was confined largely to small projects for the benefit of individuals or small groups of farmers. The construction cost of large community projects has been paid out of an appropriation of $500,000.00 provided originally under the Supplementary Public Works Construction Act, 1935, (Item 6, Western Conservation Works). Engineering services for the large projects, however, have been provided for under the Prairie Farm Rehabilitation Act.

Since the inauguration of the rehabilitation program in 1935, over 5900 applications for assistance have been received and a total of 1823 small projects have been completed, mostly during the past fiscal year. In addition, some 28 large projects

have been constructed or rehabilitated. Further details of this work are given below under appropriate headings.

SMALL WATER DEVELOPMENT PROJECTS

Supervision of Small Projects,- Under the original set-up of the rehabilitation program all water development projects were supervised by a central Water Development Committee. With the substitution of three provincial committees early in 1936, all engineering work in connection with small projects was transferred to the Water Rights Office of each Province, but with continued financial support from Federal rehabilitation funds. This change has greatly simplified the authorization of projects where provincial water rights are concerned.

Assistance for Small Projects,- During the earlier stages of the rehabilitation program financial assistance for the construction of small projects was on the basis of 3 cents per cubic yard of earth moved, a maxima of $50.00, $150.00, and $350.00, for dugouts, stockwatering dams, and irrigation projects respectively. On October 1st, 1936, the basis of assistance was increased to 4½ cents per cubic yard of earth removed, and the maximum for dugouts was raised to $75.00. Additional assistance was also provided for rock removal, construction, and for materials. The financial assistance now offered for small projects is as follows:

Dugouts: Assistance of 4½¢ per cubic yard of earth removed to a maximum of $75.00.

Stockwatering Dams: Assistance of 4½¢ per cubic yard of earth removed, 25¢ per cubic yard of rock work, and the cost of materials as specified by the supervising engineer, to a total maximum of $150.00

Irrigation Projects: Assistance as for stockwatering dams, but to a maximum of $350.00.

Neighbour Dams: Where two, three, or four individuals find it advantageous to pool their water storage, financial assistance on the same basis as for stockwatering dams, but to a maximum of $500.00 per project may be offered.

Proposed projects are examined as regards their agricultural feasibility by agricultural supervisors, from the Federal Rehabilitation Office at Regina, Sask., before being submitted to the Water Development Committee in the Province concerned, for final approval and engineering action.

Progress in Small Water Development Projects

Due to the fact that the rehabilitation program was largely in the process of organization during 1935, only 77 small projects were completed prior to March 31st, 1936. For this reason it is convenient to present in this report a statement on the progress made with small water development projects since the inauguration of the program, rather than for the fiscal year 1936-37 alone. In the following table is shown the number of applications which have been received for assistance with small projects, the number of such projects constructed, and the number of projects for which financial assistance has been provided. This information is given by provinces and major districts.

PROGRESS IN WATER DEVELOPMENT
SMALL PROJECTS
UNDER THE PRAIRIE FARM REHABILITATION ACT
FOR THE FISCAL YEARS 1935-36 & 1936-37

Province & District	APPLICATIONS RECEIVED				PROJECTS REPORTED COMPLETED				PROJECTS FOR WHICH FINANCIAL ASSISTANCE HAS BEEN PROVIDED			
	Dugouts	Stock-watering dams	Irrigation Proj.	Total	Dugouts	Stock-watering dams	Irrigation Proj.	Total	Dugouts	Stock-watering dams	Irrigation Proj.	Total
MANITOBA	908	97	15	1,020	527	34	0	561	506	29	0	535
SASKATCHEWAN												
Southeastern	990	427	66	1,483	258	114	15	387				
Southwestern	365	945	320	1,630	116	270	61	447				
North Central	211	200	36	447	53	34	4	91				
Total for Saskatchewan	1,566	1,572	422	3,560	427	418	80	925	301	304	55	660
ALBERTA												
Southern	100	464	233	797	26	133	39	198				
North Central	94	315	115	524	34	83	22	139				
Total for Alberta	194	779	348	1,321	60	216	61	337	44	161	27	232
GRAND TOTAL	2,668	2,448	785	5,901	1,014	668	141	1,823	851	494	82	1427

From the foregoing table it will be observed that 1823 small projects were reported as completed by March 31st, 1937. Of this number of projects, 1014, or 56 per cent were dugouts, 668, or 37 per cent were stockwatering dams, and 141, or 8 per cent were small irrigation schemes. By provinces the distribution of projects was as follows:

561, or 31 per cent in Manitoba
925, or 51 per cent in Saskatchewan
337, or 18 per cent in Alberta

A noteworthy feature of the water development work is that dugouts accounted for 94 per cent of the projects in Manitoba, 46 per cent in Saskatchewan, and only 18 per cent in Alberta. Of the total of 1,014 dugouts constructed, 785, or 77 per cent were located in Manitoba and southeastern Saskatchewan. Stockwatering dams on the other hand showed an opposite trend, accounting for only six per cent of the projects in Manitoba, 45 per cent in Saskatchewan, and 64 per cent in Alberta. This distribution reflects in some measure the type of agriculture in different parts of the Prairie Provinces, dugouts being well adapted to the relatively small farms in the eastern area, while stockwatering dams are suitable for grazing areas further west.

Since the inauguration of the program 141 small irrigation projects have been completed representing a total irrigible area of 10,691 acres. Of the 141 small irrigation projects constructed, 100 or 71 per cent have been located in southwestern Saskatchewan and southern Alberta, largely for the production of forage supplies in grazing areas.

An interesting feature of the water development work is that a large number of farmers and ranchers have been enabled to construct water development projects representing investments of possibly five times the amount of assistance, financial and engineering, which they have received from rehabilitation sources. In this manner the principal objective of the rehabilitation program, namely, to assist the farmer to solve his own problems, is being

realized. Another interesting point is that the small irrigation projects, representing on the average about 75 acres of irrigable land, have been constructed for an actual cash expenditure of much less per acre than has been the case with larger, more ambitious projects.

LARGE COMMUNITY WATER DEVELOPMENT PROJECTS

The construction of community irrigation and water storage projects at suitable points in the drought area, originally provided for under the Supplementary Public Works Construction Act, 1935, is an integral part of the water development program. Under the classification of community projects are included municipal storage dams, works in incorporated irrigation districts, and other large projects of a public nature. These projects differ from the previously described "small" projects in that no definite scale of financial assistance has been formulated, each project being considered on its merits.

The purpose of the community project is to provide desirable water storage facilities which, while too costly for private enterprise, may be economically constructed on the basis of per capita cost to individual water users. To this end, projects are located on sites where local conditions of topography, stream flow, and relation to surrounding farm or ranch land are particularly advantageous. In some cases existing large irrigation schemes have been assisted to continue operations, with the object of safeguarding the interests of local water users.

An essential condition in all community water development projects under the rehabilitation program is that a legally incorporated body, such as a municipality or an irrigation district, be prepared to assume all responsibility for the maintenance, operation, and control of works when completed. As surface water resources in the Prairie Provinces come under Provincial jurisdiction, all project must conform to the water rights legislation in each province. Cooperation in this respect is effected through

the provincial representatives on the Water Development Committee.

Progress in the Construction of Large Projects

Since the start of the rehabilitation program, work has been done on 30 community projects. During 1935 some seven projects were completed, including one municipal dam at Souris, Man., one at Crystal City, Man., and four stockwatering dams in the municipality of Edward, Man. In addition, certain improvements and extensions were effected in the works of the Eastern Irrigation District, Brooks, Alta., (formerly C.P.R. Eastern section). This work in the Eastern Irrigation District has already resulted in a decided improvement in the financial condition of the District, some 10,000 acres of additional irrigable land made available through the extensions constructed in 1935, having been disposed of at prices from $7.00 to $10.00 per acre. Other projects started in 1935 were completed in the following year, as indicated below.

Work on Large Projects During the Fiscal Year 1936-37

Descriptions of the various community water development projects under construction during 1936-37, together with accounts of the progress made during that period are presented herewith by Provinces.

MANITOBA

No work was undertaken on community dams during 1936, with the exception of repairs to the stockwatering dam at Crystal City which was damaged during the spring run-off.

SASKATCHEWAN

Val Marie Irrigation Project:- The Val Marie Irrigation Project, which was started in 1935 and completed in 1936, is the largest project so far constructed under the rehabilitation program. This project located on the Frenchman River near Val Marie in southwestern Saskatchewan is designed to provide dependable supplies of supplementary feed for a large adjacent ranching district by

the irrigation of 4,400 acres of river bottom land. For this purpose an earthern dam, 30 feet high and 3625 feet long has been constructed across the Frenchman River about 6 miles above Val Marie to create a storage reservoir of some 6,000 acre-feet capacity. In addition some 3,000 acre-feet of water may be utilized by direct diversion from the river into the irrigation canals. Water from the reservoir is conveyed by canal to the irrigable lands adjacent to Val Marie. For the future operation of the project the Val Marie Irrigation District No. 2 has been incorporated under the Saskatchewan Irrigation Districts Act.

During 1936 a topographical survey established the irrigable area in this project at 4,400 acres. Of this area some 1,569 acres are controlled by the Provincial Government, the remainder of the land being privately owned. A soil survey, conducted during 1936, indicates that much of this land is suited for the production under irrigation of such forage crops as alfalfa.

For the utilization of the Val Marie Project, subdivision of the irrigable area into possibly 80 acre blocks is contemplated, with a view to disposal by the District to farmers and ranchers in the surrounding district.

Eastend Irrigation Project. - This project, located some 50 miles northwest of Val Marie on the Frenchman River, was started and completed during 1936. By means of a dam 23 feet high and 1,350 feet long, a reservoir of 1,650 acre-feet capacity has been provided for the irrigation of lands near the Town of Eastend. The irrigable area in this project, as determined by a topographical survey, is 1,473 acres. The extension of this area, by the construction of additional canals, is under consideration. Irrigation of gardens in the town of Eastend, with water diverted from this project is also provided for.

Utilization of irrigable land in the Eastend Project will be similar to that proposed for Val Marie.

Waskana Amelioration Project.- The Waskana Amelioration Project,

located in the Rural Municipalities of Lajord and Edenwold, was undertaken in 1935 and completed in 1936. The purpose of this project was to prevent the spring flooding of about 13,000 acres of land along Waskana Creek, near Lajord, by straightening the creek channel.

Adams' Lake Dam. - The Adams Lake storage reservoir, with a capacity of 2,000 acre-feet was constructed during 1936 in the provincial forest reserve in the Cypress Hills. In addition to providing regulation of flow in Battle Creek, this project is intended to augment the supply of water for existing flood irrigation projects on the Battle Creek drainage basin.

Middle Creek Dam. - The Middle Creek Storage Dam which was constructed during the years 1935 and 1936, is located on Middle Creek about 20 miles north of Govenlock in southwestern Saskatchewan. This dam, 1,195 feet long and with a maximum height of 31 feet, is capable of impounding approximately 20,000 acre-feet of water. The reservoir so formed covers 1,380.3 acres, of which 908.5 acres are in Saskatchewan and 471.8 acres in Alberta. The purpose of this project is to maintain stream flow during the summer months and to provide for the flood irrigation of about approximately 900 acres of river bottom land along Middle Creek. The Middle Creek project, together with the related Adams Lake Project, should prove beneficial to the surrounding ranching territory, by providing dependable reserves of water for stockwatering purposes and for the irrigation of forage crops.

Long Creek Dams. - During 1936 dams were constructed on Long Creek, a tributary of the Souris River, near Estevan in southeastern Saskatchewan. These dams, with storage capacities of 137 and 90 acre-feet respectively, provide stockwatering facilities for their immediate neighbourhoods, and help to improve water supply for the town of Estevan.

Coderre Dam. - All engineering preparations have been made for the construction of a stockwatering dam on the Wood River near Coderre,

but actual construction has been deferred until certain property in the proposed reservoir shall be acquired.

ALBERTA

Canada Land & Irrigation Company, Vauxhall. - This project, on which construction was started in 1909 and actual irrigation in 1920, provides for the irrigation of approximately 50,000 acres of land in the Vauxhall area lying between the Oldman and Bow Rivers near their junction. Irrigation water for this project is diverted from the Bow River near Carseland, and conveyed by canal for a distance of 110 miles to the irrigable area. In 1935, some 250 farmers were located on the irrigated land of this project, while an additional 400 had access to the watering facilities provided by the canal.

Owing to financial difficulties arising from heavy capital and maintenance costs, the Canada Land & Irrigation Company found itself, by 1935, unable to continue operations. As discontinuance of the water supply would entail serious economic loss to settlers on the irrigable land of this project, financial assistance from Rehabilitation funds was advanced to the Company to cover necessary repairs and temporary operation costs.

Construction on the Canada Land & Irrigation Works during 1936 included the reconditioning of the main dam across the Bow River, replacement of a large siphon, repairs to various structures along the canal, and replacement and extensions to the distributing laterals.

Wildhorse Dam - With financial assistance provided through the rehabilitation program the Wildhorse Water Storage Society constructed a dam during 1935 and 1936 on Elbow Coulee in the south-eastern corner of Alberta. This dam, which is 1700 feet long and 30 feet high, will impound some 4,000 acre-feet of water to be diverted from Sage Creek. The object of this project is to provide stockwatering facilities for neighbouring ranchers, and for the

production of forage by the irrigation of several hundred acres of land.

Mountain View Irrigation District. - The Mountain View Irrigation District, located in the southwestern corner of Alberta, contains approximately 3,600 acres of land which can be irrigated with water diverted from the Belly River. Works in this District had been under construction by the resident farmers since 1923, but owing to lack of funds and engineering services, the project had not been completed. Through assistance provided under the rehabilitation program during 1936, these works have been developed to enable irrigation of a considerable area of land. As this District has no bonded indebtedness, there should be no serious obstacle to its successful operation.

Special Municipal Areas of Alberta - The Special Municipal Areas Board of Alberta controls over seven million acres of land in the very dry east central portion of the Province. The provision of reserves of water for stock in this region, which is largely utilized for grazing, is an important consideration. With financial assistance under the rehabilitation program, the above mentioned Board constructed 12 community stockwatering dams and one dugout during 1936 in the Berry Creek and Tilley East areas. The foregoing developments are in agreement with the land utilization policy being followed in these areas.

Atlee Exploratory Gas Well - The Red Deer River near Atlee lies in the centre of a large grazing area, where the ranching industry is subject to severe hazards from periodical droughts. Production of forage supplies by the irrigation of the river bottom lands along the Red Deer Valley offers one method of stabilizing the local livestock industry. In this area, however, the only feasible method of irrigation is by pumping water from the river, for which purpose a cheap source of power, such as natural gas, is desirable.

With the object of determining if subterranean supplies of gas are economically available in the Red Deer Valley, work on drilling a test well was commenced near Atlee in the fall of 1936. Before winter weather made it advisable to discontinue operations, this well had been drilled to a depth of 516 feet, and a slight flow of gas secured. As there is evidence that this source of gas would prove unsatisfactory for power pumping, however, it is proposed to continue drilling a depth of 800 or 900 feet where geological conditions are considered more favourable for gas production.

SUMMARY OF COMMUNITY PROJECTS FOR THE FISCAL YEAR ENDING MARCH 31, 1937.

For reference the essential facts regarding community water development projects constructed during the fiscal year 1936-37 are presented in the following statements, one for Saskatchewan and one for Alberta.

CONSTRUCTION OF COMMUNITY WATER DEVELOPMENT PROJECTS IN SASKATCHEWAN DURING THE FISCAL YEAR ENDING MARCH 30, 1937

PRAIRIE FARM REHABILITATION ACT

Project	Location	Description of Project	Length of Dam	Details of Works			Remarks
				Maximum Height of Dam	Capacity of Reservoir	Irrigable Acreage	
			feet	feet	acre-feet	acres	
Val Marie Irrigation Project	Tp.4-Rs 13 & 14 W3 & Tp.3-13 W3	Irrigation	3,625	30	6,000	4,400	Construction completed in 1936
Eastend Irrigation Project	Tp.6-Rs 21 & 22-W4	Irrigation	1,350	23	1,650	1,453	Construction completed in 1936. Old project rebuilt.
Waskana Reclamation Project	R.M. of Lajord	Drainage of spring flooded land		Waskana Creek bed straightened.			Completed in 1936. 13,000 acres reclaimed.
Adams Lake Storage Project	SW14-8-29 W3	Stockwatering & irrigation	300	23	2,000	-	Completed in 1936.
Middle Creek Storage Project	NE21-5-30W3	do	1,195	31	20,000	900	Completed in 1936.
Long Creek stock-watering dams Dam No. 1	NW 10-2-8-W2	Stockwatering & storage	188	18	137.5	-	Completed in 1936.
Dam No. 2	SW 15-1-8-W2	do	162	19	90.0	-	Completed in 1936.

CONSTRUCTION OF COMMUNITY WATER DEVELOPMENT PROJECTS IN ALBERTA DURING THE FISCAL YEAR ENDING MARCH 30, 1937.

PRAIRIE FARM REHABILITATION ACT.

Canada Land & Irrigation Company	Vauxhall	Irrigation of crop land. Water diverted from Bow River near Carseland, conveyed by canal 110 miles long to irrigable area around Vauxhall. This project originally constructed between 1909 and 1920 has been reconditioned.
Wild Horse Storage Dam	N23-2-3 W4	Dam 1700 feet long, 30 feet high, to store 4,000 acre feet of water for stockwatering and irrigation of approximately 400 acres. Constructed in 1936.
Mountain View Irrigation Dist.	Twps. 2 and 3, Rs. 27 & 28, W4	Project started in 1923, for irrigation of 3,600 acres of land. Water diverted from Belly River. Assistance granted to put project into operation.
Experimental Gas Well	Atlee	Exploratory boring to determine if natural gas can be secured in sufficient volume to power pumping for irrigation in the Red Deer Valley. This well has been drilled to a depth of 516 feet and indications of gas have been found.
Special Municipal Areas Board of Alberta	Berry Creek Area	Five community stockwatering dams constructed in the Berry Creek area during 1936.
	Tilley East Area	Seven community stockwatering dams and one dugout in the Tilley East area during 1936.

PRAIRIE FARM REHABILITATION ACT

Expenditures by activities 1935-36 and 1936-37

Activity	Fiscal Year ending March 31,1936	Fiscal Year ending March 31,1937	Total
	$	$	$
District Experiment Sub-Stations	70,524.51	73,787.77	144,312.28
Reclamation Projects	14,719.55	40,022.48	54,742.03
Agr. Improvement Assns.	1,156.43	4,011.62	5,168.05
Tree Planting	18,602.79	31,092.05	49,694.84
Grass Seed Development	48,066.34	10,361.71	58,428.05
Soil Survey	12,842.69	34,424.52	47,267.21
Soil Research Laboratory	7,632.62	24,005.64	31,638.26
Economic Survey	5,832.40	10,988.39	16,820.79
Hydrometric Survey	7,483.31	3,301.76	10,785.07
Administration	31,681.50	22,917.58	54,599.08
Water Development, Small Projects and Administration)	123,881.87	237,704.19	361,586.06
Large Scale Regrassing	----	1,351.04	1,351.04
Reserve for Purchase of Seed	----	29,210.86	29,210.86
Publications	----	4,420.13	4,420.13
Moving settlers	----	5,378.31	5,378.31
Distribution of Pure Grain Seed	----	38,745.60	38,745.60
Agricultural Extension	----	18,825.94	18,825.94
Special Soil Research	----	4,597.27	4,597.27
Feed Relief Administration	----	39,007.94	39,007.94
Land Ownership Investigations	----	5,859.19	5,859.19
Total P.F.R.A.	342,424.01	640,013.99	982,438.00
Total, Western Conservation Act[x]	60,091.61	319,804.79	388,896.30
Total, Rehabilitation Program	411,515.52	959,818.78	1,371,334.30

[x] Details on page 50

Prairie Farm Rehabilitation

Expenditures on Large Water Development Projects

Western Conservation Works 1935-36 and 1936-37

Project	Fiscal Year ending March 31,1936	Fiscal Year ending March 31,1937	Total
	$	$	$
Souris Dam, Man.	4,000.00	-----	4,000.00
Crystal City Dam, Man.	2,978.91	355.33	3,334.24
Municipality of Edward) Man., 4 dams)	9,389.84	824.19	10,214.03
Val Marie Irrigation) Project, Sask.)	3,935.08	121,687.60	125,622.68
Eastend Irrigation) Project, Sask.)	----	63,940.00	63,940.00
Adams Lake Dam, Sask.	----	7,457.51	7,457.51
Middle Creek, Sask.	3,261.31	9,384.10	12,645.41
Waskana Reclamation) Lajord, Sask.)	7,500.00	6,300.00	13,800.00
Long Creek Dams, 2) near Estevan,Sask.)	----	17,431.08	17,431.08
Wild Horse Dam, Alta.	8,036.37	9,926.36	17,962.73
Eastern Irrigation) District, Brooks, Alta.)	14,990.00	----	14,990.00
Canada Land and) Irrigation Co. Vauxhall,) Alta.)	15,000.00	65,000.00	80,000.00
Red Gas Well, Alta.	----	4,814.09	4,814.09
Special Municipal Areas,) Alta.)	----	9,684.53	9,684.53
Mountain View Irrigation) District, Alta.)	----	3,000.00	3,000.00
	69,091.51	319,804.79	388,896.30

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1936/37

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